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PART 6.

DECEMBER, 1911

THE
BRITISH WARBLERS

A HISTORY WITH PROBLEMS
OF
THEIR LIVES

BY

H. ELIOT HOWARD, F.Z.S., M.B.O.U.

ILLUSTRATED BY HENRIK GRÖNVOLD

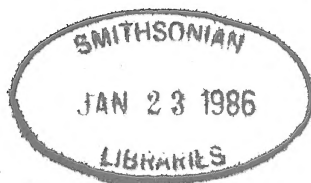
London

R. H. PORTER

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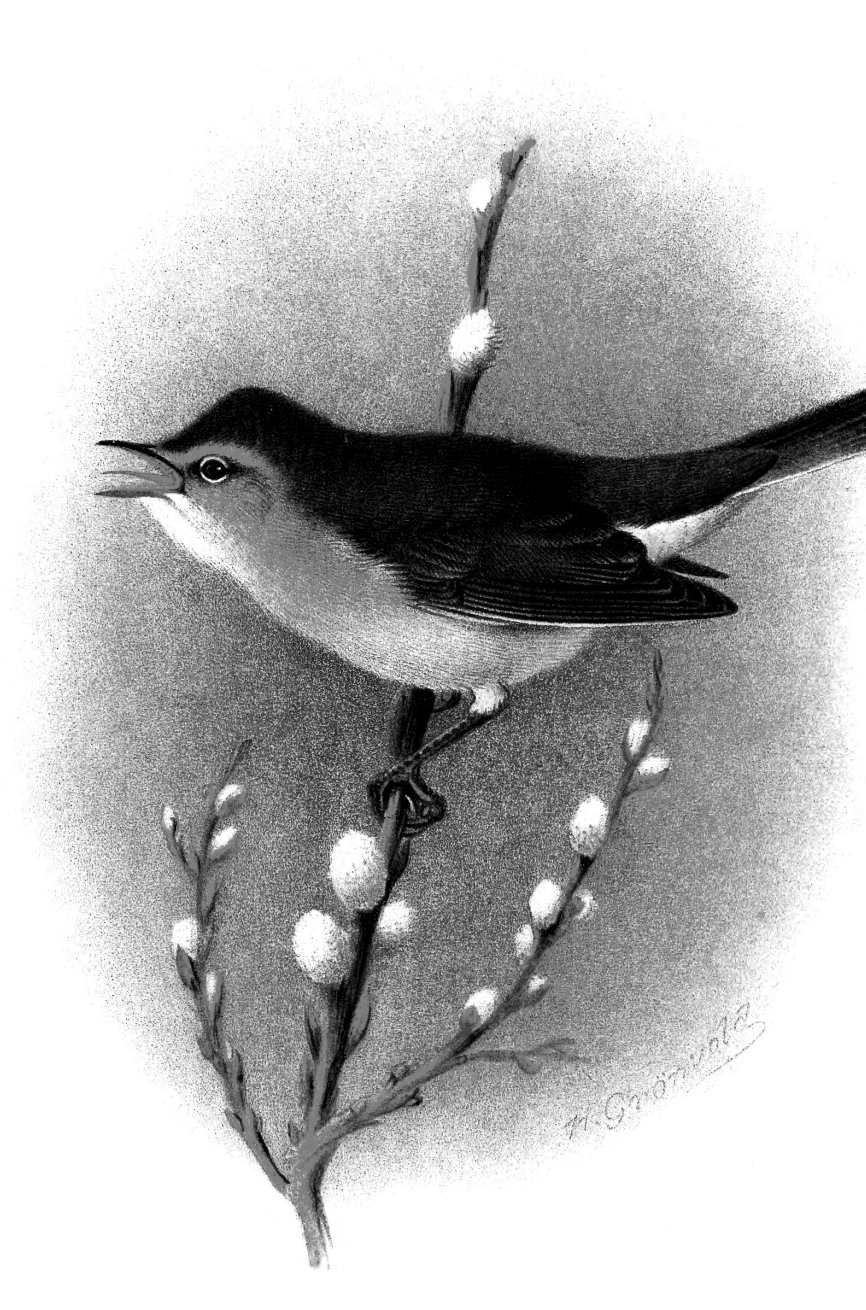
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H. G. M. 1883

WILLOW WARBLER

WILLOW WARBLER.

- Sylvia trochilus**, *Meyer, British Birds*, folio Ed., vol. i, pl. 70 (coloured figure of adult and egg) [1835-43]; *Hewitson, Eggs of British Birds*, 2nd Ed., vol. i, pp. 101-102, pl. 28, figs. 3 and 4 (eggs), 1846; *id., id.*, 3rd Ed., vol. i, pp. 137-138, pl. 36, figs. 1 and 2 (eggs), 1856.
- Sylvia trochylus**, *Hewitson, British Oology*, 1st Ed., vol. i, 2 pp., pl. 115, 2 figs. (eggs), 1835.
- Phyllopneuste trochilus**, *Macgillivray, British Birds*, vol. ii, pp. 371-378, 1839; *Gould, Birds of Great Britain*, vol. ii, 2 pp., pl. 65 (coloured figures of adult male and female), 1862.
- Phylloscopus trochilus**, *Yarrell, British Birds*, 4th Ed., edited by Newton, vol. i, pp. 432-436 (woodcut), 1873; *Dresser, Birds of Europe*, vol. ii, pp. 491-496, pls. 75 and 76 (coloured figures of adults in early summer and autumn plumage), 1879; *Seebohm, British Birds*, vol. i, pp. 430-434, pl. 10, fig. 10 (egg), 1883; *Booth, Rough Notes*, vol. ii, pp. 59-61, pl. 5 (coloured figure of adult and northern variety), 1883; *Lilford, Coloured Figures*, vol. iii, p. 64, pl. 32 (coloured figure of adult), 1887; *Saunders, Manual of British Birds*, 2nd Ed., pp. 69-70 (woodcut), 1897.

Croatian, *Brezja Zenika*; Czechisch, *Budnicek vetsi*; Dutch, *de Fitis*; Finnish, *Uunilintu*; French, *Pouillot-fitis*; German, *Fitis-Laubvogel*; Hungarian, *Közönséges rendike*; Italian, *Lui grosso*; Norwegian, *Löfsanger*; Russian, *Penotschka*; Spanish, *Mosquitero, Mosquilla*; Swedish, *Löfsangare*.

DESCRIPTION OF THE PLUMAGE.

Adult Male in Spring.—All the upper parts are greenish olive grey, but the crown and rump are brighter and slightly more olive yellowish green. The flight and tail feathers are brown narrowly edged with the same colour as the upper parts, while the innermost and greater secondaries are broadly edged with this same colour. The bastard wing is brown, and the least wing-coverts the same colour as the back. The superciliary stripe is pale olive yellow, the lores smoky grey,

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and the sides of the head the same colour as the upper parts, only somewhat lighter and more buffish. The throat is whitish, the upper breast the same colour, only washed with olive buff and striped narrowly with lemon yellow, and the abdomen whitish. The flanks are olive grey washed with a yellow tint, the under tail-coverts whitish washed with yellow, and the underside of the wings and tail lavender grey.

The axillaries and under wing-coverts are sulphur yellow. The upper mandible is horn brown, the lower yellowish buff, and the flanges light lemon yellow. The iris is brown, the feathers on the eyelid whitish yellow, and the feet and claws brown, the soles being olive yellow.

The sexes are alike in plumage.

In autumn the upper parts are richer and of a more greenish olive brown, the primaries have narrow light olive grey tips, and the colouring of the under parts is more intense.

Nestling.—The upper parts are olive grey, slightly brighter on the forehead and rump. The wing and tail feathers are darkish ash grey, the flight and tail feathers being narrowly edged with olive buff and the greater wing-coverts and the rest of the feathers on the wing broadly margined with olive grey. The lores are dark ash grey, sides of the head olive brown, and the superciliary stripe—which is not very conspicuous—is light yellowish buff, the feathers on the eyelid being of this latter colour. The throat is bright yellowish buff and the pectoral tract is the same colour but suffused with light lavender buff. The flanks are also bright yellowish buff. The abdomen and the under tail-coverts are light yellow, and the underside of the tail and flight feathers is light ash grey. The mouth is orange buff, but the tip of the tongue is rather more reddish.

The upper mandible is greyish horn colour and the lower buff colour, the flanges being whitish yellow. The iris is dark greyish brown. The feet are light greyish olive, and the toes rather more of a buff colour with olive yellow soles, the claws being greyish brown.

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On leaving the egg the bird has its eyelids completely sealed.

GEOGRAPHICAL DISTRIBUTION.

In **England** it is generally distributed and common, and to **Scotland** it is on the whole an abundant summer visitor, but in the Outer Hebrides it has only been found nesting in Barra, and it is not recorded as nesting in the Orkneys although it does so in the Shetland Islands. In **Ireland** it is common in all suitable localities.

Throughout the greater part of **Western Europe** it is generally distributed. In **Spain** it is found locally as far south as Gibraltar, but is not common. **Portugal** appears to be visited only on migration. We find it a common breeding species in almost every part of **France** excepting the south-eastern corner, where it is only found on migration, and it is abundant in **Belgium**, **Holland**, **Switzerland**, **Germany** and the **Austro-Hungarian Empire**. In **Norway** and **Sweden** it is a summer visitor, numerous in places, breeding in the mountains up to the limit of the trees, and inhabiting even the extreme north of that continent. In **Italy** the bird is abundant in summer in the northern and central provinces, but rather rare on the Adriatic Coast and occasionally visits the mountains of Sardinia, though absent from Corsica. Though fairly common in **Bulgaria** it does not seem to be a breeding species in **Turkey** and **Greece**. Throughout **Finland** it may be said to be generally distributed and common, the country between St. Petersburg and Archangel is also inhabited, and we find it breeding in the provinces of Vologda, Western Archangel, Viatka, Perm, and the valley of the Petchora. Eastwards from here we trace it to the valleys of the rivers Ob, Yenisei, Lena, and Kolima. Though common in **Poland**, in the vicinity of St. Petersburg, in the provinces of Novgorod, Tver, Jaroslav, and Moscow, in the district between the rivers Volga and Oka, and in the province of Kasan and neighbouring provinces, yet there seems to be some doubt as to whether it

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breeds in the south-western provinces, although occurring there on migration. In the south-eastern part of **European Russia** we find it on the south-western slopes of the Ural mountains, in the province of Orenburg, and occasionally in the Kirghiz Steppes, and further south still in the Caucasus and Trans-Caucasia. It is probable that it breeds in suitable localities in **Northern Africa**. The Transcaspian Province, parts of **Persia, Asia Minor, Turkey, Palestine** and **Greece** are visited on migration.

Its winter quarters in **Europe** may be said to begin in the south of **France** and to extend through **Spain**, parts of **Italy, Sicily, Greece** and **Asia Minor**. The majority, however, pass on to **Africa**, where they have been traced to **Morocco, Algeria, Tripoli**, the oases of the Sahara, **Egypt** and the vicinity of the White Nile, **Abyssinia, Somaliland, East Africa, Uganda**, the **Congo Free State, Rhodesia, the Transvaal, Orange River Colony, Cape Colony** and up the west coast through **Namaqualand, Damara Land, Fernando Po** and **Sierra Leone**.

LIFE-HISTORY.

Of the three members of the genus *Phylloscopus* which are common summer visitors to this country, the Willow Warbler is probably found in the greatest numbers, though not necessarily in every district. In some parts the Chiff-chaff may be the more numerous, or even to some extent take its place, but on the whole the Willow Warbler is the more common bird. It frequents localities similar to those in which we find the Chiff-chaff common, but is not so partial in its choice, for it can often be found in open places and even in the centre of large woods and forests. Wooded banks, dingles, small coppices, the outskirts of large woods, gardens, and in fact plantations of almost every description are resorted to, and made use of for the purpose of reproduction. If there is any one locality for which the bird seems to show some partiality, it is that in which a territory can be obtained adjoining an osier-bed containing willows of some

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description, and therefore the prefix "Willow" which has been applied to it, and which may seem somewhat trivial, is in reality expressive of a characteristic, though but a small one, of the species.

In the order of migration the bird must be placed between the Chiff-chaff and Wood Warbler, since it arrives considerably later than the former species and somewhat earlier than the latter. As in the case of the Chiff-chaff, the date of arrival varies year by year—at least in the west Midlands where my records have been kept—the earliest record I have being March 30th, and the latest April 16th. On the average the first males may be expected towards the latter end of the first week in April, but all the males do not arrive on the same day or during the same week, the migration extending over some days. Neither do they all arrive before the females, but the majority do so; the first females, however, are usually later by a week or more in reaching the breeding grounds than the first males. Meteorological conditions no doubt influence the migration and are a cause of erratic movement. Insect life is scarce in cold springs, and in exceptional weather almost entirely absent for a time, and upon insects these birds entirely depend for sustenance at this season of the year. When, therefore, we find the smaller and more delicate-looking Chiff-chaff a fortnight earlier still at this critical period, we naturally seek an explanation. What difference there can be in the constitution of the Chiff-chaff that enables it to face such inhospitable conditions so much earlier we do not know, and yet there must be some reason, some advantage to be gained by its doing so. Can it be that the restless activity, so prominent a feature of its behaviour, enables it to find a living even under the most adverse conditions? It may be so, for in studying the two species the Willow Warbler certainly appears to be less active and rather more sluggish in its movements. But although this may be a reasonable explanation of the one being able to exist under more trying conditions than the other, yet it leaves the main difficulty unsolved,

namely, why, in the case of two such closely allied forms living in a similar environment, one should arrive at its breeding ground so much in advance of the other.

The law of breeding territory forms as important a part in the life-history of this bird, at this particular season, as it does in that of so many others. Similar conflicts occur, similar petty struggles; in fact, the whole routine of the life of the male, previous to and after the arrival of the female, may be said to be almost identical with that of the male Chiff-chaff. Inasmuch, however, as this law seems to be one of some importance in the life of many species of birds, and possibly other vertebrates, I shall describe minutely any details that have come under my notice bearing upon the question, no matter how small or perhaps even trivial they may seem, and no matter how similar to those in the life of the Chiff-chaff or any other species already dealt with. In order to observe the behaviour of the birds during this period, it is as well to select some wooded bank inhabited by a number of males and divided into a number of adjoining territories. For such territories are never very large—although they vary considerably in extent, being perhaps twenty-five, forty, or sixty yards in length—and consequently it is by no means impossible to keep three adjoining areas under observation at the same time, which is an advantage and often an assistance in enabling one to interpret the actions of the different inhabitants. Moreover, where possible, the same wooded bank or plantation should be selected for two or three years in succession, since by this means alone is it possible to discover through actual observation whether the same males return to the same territories year after year; and besides, by so doing, one commences each season with a considerable and important knowledge of the previous life-history of the various inhabitants of that particular locality. As to whether the same males do return to the same territories we know very little. There are certain authenticated facts which show that birds do sometimes revisit their birthplace, and, in the case of the

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adults, even appropriate the old territory, but what is of more concern to us is the extent to which they do so. Is it a rule for the same male to return to the same territory? And does the female seek her former mate? These are the questions which we should like to be in a position to answer, and they are questions to which I have never been able through actual observation to obtain a definite reply. The marking of young birds may tell us whither they go, and whether they return to the locality of their birthplace, but upon the point in question it can clearly throw no light unless some system can be devised whereby the owners of certain territories are annually caught and released. In the case of some of the migrants males are the first to reach their destination, afterwards the sexes arrive intermingled, but not paired. A male takes up its territory and there awaits a female, upon whose arrival pairing takes place. The young are then hatched, and as soon as they are capable of taking care of themselves the parents desert their territory and appear to separate. Will they again meet the following breeding season? Is it likely, in the first place, that both will survive? We have no direct evidence to guide us in estimating the average duration of life of an individual under natural conditions, but we can be certain that it varies enormously in different species. However, we are here considering the migrants only; and bearing in mind the mortality which must and does occur amongst them during migration, from scarcity of food, from vagaries of climate, from disease and from natural enemies, and fixing our attention on the fact that there is no perceptible increase in their numbers year by year, how can we regard such an existence as otherwise than a precarious one? And are not the chances, therefore, of both surviving somewhat remote? Assuming, however, that both escape the numerous dangers that threaten them, and are consequently capable of breeding the following spring, will both male and female steadfastly make their way back to the same few acres of ground which they inhabited the

previous year, and, ignoring all other opportunities of pairing, await a happy reunion? No one, I think, would suggest that during all these months of wandering in the wilderness they carry in their memory the image of a former mate, and that when the sexual instinct develops at the proper season this image becomes the central attraction, a goal that, at any cost, must be attained. Would not one rather suggest that a habit which had been formed in one season would be sufficient to bring about continued pairing without attributing to the birds any undue powers of recognition? The whole question resolves itself into one of expediency. Will Nature obtain the best results if a male postpones pairing until the advent of its former mate? Let us consider the position of a male. It arrives alone in the spring at its destination, and takes up its former territory. And what then? If it has no recollection of a former mate, it must take the first opportunity that arises of securing one, and will probably pair with the first female that enters its territory. On the other hand, if the female of the previous spring still occupies a place in its memory, it must ignore all others, await its former mate that months previously may possibly have been destroyed, and thus run the risk of losing its chance of reproduction. While it is difficult to see what advantage could be gained from the same male and female pairing year after year, it is easy to see how it might thus result in disaster. For us Nature has only one purpose in view, namely, that the stronger individuals shall meet, reproduce, and reproduce frequently. And here we must bear in mind the law of territory. The male that is capable of holding a territory and defending it from all intruders is strong enough to reproduce, and the female that is able to defeat her rival is also fit to reproduce. Automatically, therefore, the stronger individuals pair. An individual that did not seize the first opportunity offered to it of pairing would not reproduce so frequently as one that did, and its descendants, if they inherited a similar tendency to hesitation, would gradually be eliminated. It would doubtless be untrue

to say that the same male and female never meet—since according to the law of chance a reunion must in some instances take place—but to lay it down as a rule that the same individuals meet again and again in consecutive seasons and are consequently paired for life is a different matter, for there could be no rule of that kind unless some useful purpose were thereby served. Inasmuch, however, as the fact that the sexes arrive at the breeding area separately admits of no dispute, and since there is every reason to believe that a similar condition accompanies their departure to the feeding area, it is evident that they are united for part of the year only, and whatever reunion does occur in the breeding season must be in the nature of a casual meeting, having, as we have already seen, little to recommend it as a *conditio sine qua non* to the pairing of the stronger individuals. In almost every part of these Islands and probably in almost every part of civilised Europe the breeding stations of most of the migratory species are constantly changing. The timber is felled and the undergrowth cleared in some wood, and the following spring it possesses no attractions for the smaller migrants, since the new growth is insufficient to provide them with shelter. But as the seasons pass by and the growth increases, more and more individuals of various species take up their territories until the whole wood becomes an important breeding station resonant with the song of many migrants. Slowly the bushes entwined with bramble and honeysuckle, which used to afford shelter for innumerable nests, increase in stature, pass into saplings, and ultimately check the growth of vegetation beneath, and correspondingly the number of migrants resorting thereto for the purpose of reproduction decreases, until the wood reverts, so far as they are concerned, to its previous state of destitution. Somehow and somewhere these former inhabitants must obtain territories. Urged by their sexual instinct they will wander from place to place seeking a new home, and find, perchance, a resting place in the same locality or possibly suffer banishment from the immediate

neighbourhood. Nearly all the migrants are thus affected. Hedgerows are demolished and osier-beds cleared, acres of reeds are cut down and beds of rushes mown; and bearing this in mind, how is it possible for us to conceive of the same male and female meeting year after year except in a limited number of cases? A male arrives at its former breeding haunt, finds it unsuitable, and passes on in search of a new home; a week later his former companion arrives on a similar errand, but in what a hopeless position, if just that one particular male is her ultimate goal; Nature's purpose would surely be better fulfilled if she seized the first opportunity of pairing.

The male Willow Warblers, like the males of other migratory species, seem to arrive at their breeding ground for the most part during the night, and to sing the morning after their arrival. In the earlier part of the season the frequency with which they utter their song is, to some extent, influenced by the weather. If it is cold they are more silent and by no means so active, but under ordinary conditions they sing incessantly during the first few hours of daylight. They search for food in their territories, travelling first in one direction and then in another, sometimes high up in the topmost branches of such trees as oak or ash, at other times in the undergrowth or bushes, and yet again upon the ground or even along the banks of a stream, uttering their plaintive song at intervals. When sufficient food has been found they resort to some branch, often at a considerable height from the ground, and there preen their feathers. In some cases one particular tree seems to be especially favoured, and to constitute the headquarters of the territory, from which excursions are made in different directions within the domain.

Previous to the arrival of a female excitement may be caused either by the question of territory, that is to say, by one male intruding upon another's ground, or by the presence of a pair of Chiff-chaffs who happen to have taken up their habitation in the same territory. In the first of these cases there ensue frequent pursuits or conflicts; and although such

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conflicts vary much in intensity, appearing sometimes to lack determination and to be more in the nature of play, yet from closely studying the conditions under which they occur I believe that, in the majority of instances, they represent a genuine trial of strength, and that the combatants are in earnest. It is necessary to bear in mind the strength and capability of the actors, and to remember that even the most deadly of contests must always appear to us as nothing but a fluttering of tiny wings, and might readily be described by an onlooker, ignorant of the previous history, as a game. In the case of the Warblers it is not probable that the conflicts often result in the death of one of the combatants, since their bills are not of the type that would easily inflict serious injury. The law of territory, moreover, does not demand that the struggles shall be fatal. That the weaker males shall be driven away and thus leave the stronger to reproduce in peace is all that is required. This law has but one end in view, namely, that the strength of the species shall at all costs be maintained, and if the conflicts were always, or in a large number of cases, to terminate fatally this end would not be attained. For since it can clearly not ordain which individual shall compete with which, since, in fact, the law of chance must here be relied upon, battles must frequently occur between two individuals both fit to reproduce; in which case the death of one member would be a loss, not a gain, to the species as a whole. If, therefore, the individuals of any one species were to develop such extraordinary pugnacity that surrender were out of the question, and a termination were only reached when one or the other succumbed to its injuries, that species would be at a disadvantage in the struggle for existence, and in the course of time would probably be eliminated. As it is, these contests do in the case of some species sometimes terminate fatally, and how easy it would be, if truly beneficial, for a species to arise with a motto of "no surrender" can be seen from the fact that man for his own amusement has in a comparatively short space of time been

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able by selection to breed a race of game-cocks which fight to a finish. Conflicts between the male Willow Warblers on different boundaries are of frequent occurrence, and, at the commencement of the season when two appear to lay claim to the same territory, of some duration, the ruffled feathers denoting the severity of the struggle. At such times their flight is rapid. They pursue one another amongst the bushes, or close to the ground, and when they meet there is an audible clicking of bills and the impact is considerable. To some extent they are oblivious of what is taking place around them, and in their intense eagerness I have seen two combatants pass within a few feet of where I was standing. When they settle, after such encounters, they show signs of considerable excitement, jerking their wings, and giving vent to their feelings by a single or else by a purring note. In the case of males with adjoining territories, the conflicts are not so prolonged, and perhaps on the whole not so severe; they may be better described as incessant quarrels arising from trespass of boundary on the part of some individual. These contests continue for some weeks, but gradually become less and less frequent. From this description I do not wish it to be supposed that a male can never cross its boundary without being attacked, for such is not the case. At the same time I wish it to be clearly understood that, when I speak of a boundary, it is an imaginary one fixed by myself as the result of observation. Nevertheless it is possible to establish with considerable accuracy the true limits of a territory, though these limits may be intruded upon without a conflict occurring.

The second cause of disturbance referred to, namely, the antipathy shown by this species to the presence of a Chiff-chaff—possibly a mutual antipathy—is interesting. It results in frequent quarrels and conflicts, for a pair of each species often inhabit the same territory. Sometimes one is the aggressor, sometimes the other; but the Willow Warbler seems to me to be more often the cause of the strife. The battles resemble those that take place between the males of the same species,

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and consist of rapid pursuits, collisions in the air with considerable clicking of bills, and the usual signs of excitement common to the bird. Generally speaking, the conditions of existence imposed by the law of territory may at any moment become so severe as to necessitate the individuals of not only the same species, but also of others closely allied, struggling together for possession of a breeding home. In the case of the Willow Warbler and Chiff-chaff we seem to have an instance, and in truth it would be a difficult matter to discover two species to which such an extension of the law of territory might be more likely to apply. So closely do they resemble one another in structure and colouring, that expert knowledge is required to decide whether some particular skin belongs to the one or the other; and in life, where a close examination is impossible, it is often difficult to arrive at a decision. The resemblance, moreover, does not end with appearance; they live in a similar environment, require similar food, and exhibit characteristics which have much in common. Is it not then possible—is it not indeed highly probable that there is a constant struggle between them, and that their future position, the survival or decrease and possible disappearance of one or the other, is gradually being worked out before our eyes? The case is an interesting one, but perhaps not more interesting than many others if we only had sufficient facts to rely upon. The Willow Warbler is the stouter and no doubt the stronger of the two, and, as already mentioned, it seems more often to be the aggressor. Physical strength alone, however, does not decide survival; activity and power to resist unfavourable conditions are of equal value. The Willow Warbler may be gaining so far as direct struggle resulting from the law of territory is concerned, but, on the other hand, we must bear in mind the ceaseless activity which is so prominent a characteristic in the life of the Chiff-chaff, and remember that activity counts for much when unfavourable conditions arise. Scarcity of food, brought about by late frosts or exceptionally cold weather accompanied by blizzards,

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calls forth unusual energy and effort on the part of an insectivorous species; otherwise it must succumb. And doubtless it is this great activity which enables the Chiff-chaff in the latter part of March to discover sufficient insect life to prevent such an undue lowering of its vitality as might render it less able to withstand the cold inclement weather so common at that season of the year. Nevertheless, if we regard the relative positions of the two species, we must conclude that the greater strength of the Willow Warbler, which enables it with more certainty to secure a breeding territory, is of higher importance than the activity of the Chiff-chaff, since the former bird is more plentiful and more generally distributed than the latter.

There seems to be some connection between the song—or the sounds that answer to song—and the territory. The actual song is in the case of many species so remarkable and beautiful that it at once arrests our attention, and we naturally ask ourselves the meaning of it, whence it originated, or how it developed. To these questions no satisfactory answer has yet been forthcoming. Just why a Blackcap can produce such very beautiful notes and a Grasshopper Warbler such peculiar and monotonous ones is as great a mystery to-day as ever, and I do not pretend to be able to throw any light on the mysterious aspect of it, but only to indicate one direction in which it may be of some use. We must dismiss from our minds all ideas of æsthetic value, for it is clear that if there be any utility attached to the various cries, those which may sound to our ears harsh or even repulsive must, if uttered under similar conditions and at a similar season, be of equal importance to those which delight us with their beauty. The males of the summer migrants reach their destination many days before the females, take possession of their territories, and there remain singing incessantly during the first few hours of daylight, and in a lesser degree throughout the remainder of the day. The males of some of the resident species, the Chaffinch for instance, take possession of their territories very early in the year, and

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there they will be found for the first two hours or so of daylight singing incessantly, but for the remainder of the day they behave as they do during the winter months, roaming about in flocks; it is not until some weeks later that the females become sexually developed and commence to seek for mates. Territory is an essential to reproduction. By some means a male must proclaim the fact that he is in possession of a territory, and by some means the female must be made aware of the presence of a male fit to reproduce. I see no difficulty therefore in believing that all the particular sounds emitted at this season are thus of some use. And since, on the average, the stronger males only will be capable of obtaining a territory and thereby attaining to reproduction, may it not in justice be argued that a gradual increase in their power of producing sounds will automatically result? It is difficult to obtain any concrete evidence in proof of this. I will mention a few facts which may be used in support of it, and there leave it. The males we hear in full song in the spring are those which own territories and ultimately reproduce; I can recall no instance of a wandering male, that is to say, a male without a territory, in full song in the height of the breeding season. Males in search of territories sometimes pass through those already occupied and, as far as I have been able to observe, they remain silent during their transit. In the case of many species the song is uttered less frequently upon the arrival of the females and in some instances practically ceases. When two males occupy adjoining territories, and one of them utters its song whilst on the boundary, the other not infrequently attacks it forthwith.

The migration of the females extends over some days. The first females arrive about a week or ten days after the first males, but this interval is subject to variation according to the seasons. Thus it happens that males with adjoining territories do not necessarily all obtain a female on the same day. The difference is sometimes considerable, and may even amount to as much as a week. This discrepancy in the time

of arrival of the females is often the cause of much quarrelling; for although she seems to pair with the owner of the territory in which she first makes an appearance, yet throughout the first morning or the first day of her arrival she does not confine herself so strictly to the boundaries as she is wont to do later on. It is clearly impossible for her to know the limits of the territory in which she has settled; she must learn by experience; and this experience is probably gained under compulsion, for a male can sometimes be seen pursuing a female, who has crossed the boundary, and driving her back again into his territory. Her arrival in a territory is the cause of extreme sexual excitement on the part of the male who is its owner, and, if she crosses the boundary, on the part of the adjoining male. This excitement expresses itself similarly in both sexes, and results in much pursuing and frequent mock conflicts. During the pursuit the flight is often rapid, the birds twist and dart in and out of the bushes, momentarily settling, but only to commence their round again. These outbursts of excitement are by no means continuous, but spasmodic, and may be commenced by one sex or the other. Thus the female at one moment appears to call the male by singing, when he either approaches her slowly, or flies at her more abruptly, uttering at the same time a quiet purring sound. This act of flying at her is of common occurrence, and when it takes place she may on his approach spread her tail, assuming an attitude of defence which results in a fluttering of tiny wings and a momentary clicking of bills. Or he may fly towards her apparently with the object of presenting her with food—an attention on the part of the male which is common amongst many species—and he then warbles quietly or rather sings his song continuously. When the male overtakes her during the pursuit, both birds may fall fluttering to the ground in their excitement.

The manner in which sexual emotion is expressed varies in different, and even in closely allied, species. Why it should be so we cannot tell; yet the difference is often striking. I



MALE AND FEMALE WILLOW WARBLER
ATTITUDE DURING THE PERIOD OF
SEXUAL ACTIVITY

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have already mentioned that the habits of the Willow Warbler and those of the Chiff-chaff are so similar that it is well-nigh impossible to distinguish between them in actual life. This is true of their habits as a whole, but the expression of sexual emotion differs considerably, and it is possible to recognise the peculiar wing-flapping of the Willow Warbler at some distance. This wing-flapping is not confined to one sex only, but forms part, though a lesser part, of the sexual manifestation of the female. It can be seen to the best advantage—for the peculiarity is then more striking—when both sexes perform at the same moment, an occurrence by no means unusual. Settling a few feet apart, they face this way or that, often in opposite directions, and standing in an upright position on the branch, partially extend their wings, and flap them at a moderate speed. Whilst thus performing they carry their heads rather high, slightly expand their tail, and become so completely absorbed in their performances, which may last for fully half a minute, that they take little or no notice of one another. At this period during the first few hours of daylight the wing-flapping is of frequent occurrence on the part of one sex or the other; and when a number of territories adjoin and a female is present in each one of them, this curious but interesting behaviour can be observed with but little difficulty. Even when the female is not in his immediate presence, the male may be seized with sexual emotion and express it in this manner. In its details the performance varies but little, the wings are not always expanded to a similar extent, and the tail is sometimes slightly raised. Silence is often maintained, but may be replaced by a highly pitched twittering sound uttered in sympathy with the bodily movement. Although apparently so absorbed when performing alone, it is quite clear that the male is very much on the alert and knows the whereabouts of the female, for in the midst of his emotion he will dart off without hesitation towards her, when the usual fluttering of wings and rapid pursuit follow.

As the time passes by and sexual activity wanes, so the expression of the emotion subsides, until it finally disappears when the full complement of eggs is laid, except in the case of polygamy or a second brood. Let this, however, be noted, that it is not of uncommon occurrence even after the nest is completed and the first few eggs are deposited. When in the case of adjoining territories a female arrives in one of them while the owner of the other is still unpaired, and when, as is often the case, she is inclined for a while to overstep the boundaries of the territory in which she has settled, the male on to whose ground she wanders becomes excited, and may even commence wing-flapping. I recollect a case of this description which was interesting merely if we regard the actions as of direct biological significance, and as appealing to the female according to the degree in which they are executed, for it was evident that the more demonstrative male was rejected. The female in this particular case wandered from the territory in which she had settled, and from her mate who was showing little excitement, into an adjoining one, and was confronted by the owner who was apparently under the influence of sexual emotion. There she remained for a short time, while he displayed the usual signs of excitement, included in which was considerable and vigorous wing-flapping; eventually she returned to her undemonstrative husband. To such an episode I attach but little importance. The sexual instinct must vary in the same individual from day to day and even from hour to hour, and the corresponding emotion must vary with it. Incidents of this kind are therefore no more than we should anticipate under the circumstances.

Of four adjoining territories, which I had under observation one season, the behaviour of the inmates of one, which I marked as No. 2 on the rough plan made at the time, was so interesting that I offer no apology for describing it in detail, though it entails a repetition of some of the features in the life-history already mentioned. All three territories were situated upon a long wooded bank divided by a public foot-

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path which extended throughout its entire length. In some places it was more or less open, in others thickly covered with undergrowth consisting principally of hazel, bramble, and honeysuckle, and scattered here and there were such trees as oak, ash and beech. The territory I am speaking of more particularly, and to which I shall refer as No. 2, was about fifty yards in length and embraced a portion of the wood thickly covered with undergrowth. Being away from home for a few days about the middle of April, I do not know the exact date upon which the male arrived, and any initial struggle which may have occurred over the question of territory was consequently missed. On April 20th three males occupied the three adjoining territories, and the scenes which have already been described as usual previous to the advent of a female were constantly occurring between the three individuals. An oak tree situated at one end of No. 2 territory was often resorted to by the owner and may have been his headquarters; in any case he made considerable use of it, and there passed much of his time in song. From it, too, and from other parts of his territory, he was wont to make excursions into the willows. Here also he sometimes encountered No. 3 male, when a struggle usually ensued. On the morning of April 23rd three birds were in No. 2 territory, one of which I believed to be a female. This was soon confirmed, for the owner of the territory summoned by her quiet singing approached, and the usual scenes of excitement then followed. For short intervals she left him, and once wandered into No. 3 territory, but soon returned to No. 2. In the evening she was on the edge of No. 1 territory, from which she was pursued by No. 2 male, who followed her back into his own territory. Another single bird now entered and remained in this territory for a time, being sometimes pursued by the owner. April 25th found the pair together, excitement subsiding, and the male not singing so much as usual. On April 26th the female was building, the nest being situated in one corner of the territory on the boundary of

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No. 3 territory and a considerable distance from the footpath. The male at times was excitable, showing it in the usual manner, but the principal feature was his conflicts with the owner of No. 3 territory, the attacks coming first from one and then from the other. On one occasion both birds were hopping about the ground within a few feet of one another, and when one retired the other did likewise. Upon examination I found the outer part of the nest formed. The next morning both sexes showed signs of excitement, flapping their wings in the usual way; the nest had been added to, but neither bird approached it while I was present. On April 28th the female was constructing a nest in an entirely different part of the territory, and an examination of the first one revealed the fact that nothing had been added thereto since the previous day. The second nest was situated within a few feet of the footpath. Throughout the morning of April 29th the female was busy building, and considerable excitement was shown by both sexes. After this date nothing unusual occurred until May 7th; there were then five eggs in the nest, and soon after my arrival the male pursued the female and together they fluttered about the ground, coition probably taking place. A third bird now entered the territory and followed the female, who was excitable and kept flapping her wings. The male forthwith flew at this new arrival and appeared to drive it away, but later it returned, when again it seemed to be attacked by the male. At this time I thought that the intruder was the female from No. 1 territory; that it was a female I had little doubt. On May 8th this third bird again appeared, when the male, instead of attacking, followed it flapping his wings in the usual manner; this action on his part confirmed my opinion that the intruder was a female. Upon the male thus following her she retired, but presently returned and commenced to search for food close to the first female. The latter bird seemed to resent her presence and consequently flew at her, upon which she again retired. In the evening the second female was again present. On the

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morning of May 10th, noticing that a female was wing-flapping and that the male was close beside her, I examined the nest and was surprised to find the female sitting; she fluttered off in fact at my approach. The mystery, however, was soon explained, for the second female, the bird that was excitedly flapping her wings on my arrival, was rapidly building a nest. This was situated in the centre of the territory, about fifteen yards from the second nest of the first female. Later on in the morning I noticed the male in the presence of this second female excitedly wing-flapping, while the first female was actually sitting on the nest. Throughout the morning of May 11th the second female was occupied in building, and by May 13th she had laid the first egg. The full clutch of eggs was completed by May 19th, and on the morning of that day I found that the eggs which were on the point of hatching in the first female's second nest had been taken. On May 21st the first female was again building within a few feet of the footpath, this being her third nest, and in it was deposited one malformed egg on May 29th, and on June 9th she was building yet again, but this, her fourth nest, was never completed, although sufficiently advanced to allow of removal. The young were hatched in the second female's nest on June 1st. The behaviour of these three birds is interesting from more than one point of view. At the outset we have the curious fact of the first female building two nests, not taking into account the third and fourth ones which were the result of the second being destroyed. Why should she not have been content with the first nest? Some birds, it is true, commence one or even two nests before the final effort, but I am not aware of this habit in the case of the Willow Warbler. The position chosen for the first nest was at a considerable distance from the footpath, and the female could not, therefore, have been disturbed by passers-by. The actual situation was in a bank close to the roots of a large beech tree, where the soil was perfectly dry, and was consequently as suitable a one as could possibly be found, but it was close to

the boundary; this proximity gave rise to constant warfare between her mate and the owner of No. 3 territory, so long as she adhered to that situation, and, I believe, explained her desertion and the construction of another home in the centre of the territory. A bird may desert its nest on account of disturbance, but this particular female forsook a position of security for one of great danger. And, as if to leave us proof that the question of safety did not enter into her consideration, she constructed a third nest within a few feet of her second, and in as dangerous a position. Is there no significance in her building a second, a third, and a fourth nest in the centre of the territory, and the second female doing likewise with regard to her one? Interesting as this desertion of the nest may be, it is not so peculiar as the polygamous habit of the male. Amongst certain birds polygamy is not uncommon, but it is contrary to the general practice of the smaller birds, and this one instance is the only evidence that so far has come under my notice of any tendency in such a direction amongst the Warblers. I cannot, therefore, help thinking that the case is an unusual one. On the appearance of the second female scenes ensued similar to those which occurred upon the arrival of the first; that is to say, the expression of emotion was identical in both cases. The male again flapped his wings and again pursued and fluttered in the wake of his second mate, and she likewise went through the customary process of wing-flapping. It is noteworthy that the male attacked the second female on her first appearance, but ultimately yielded to her persistent intrusion, and also that the first female seemed to object always to her presence. The single malformed egg laid by the first female in the third nest is possibly not without meaning. May it not point to sexual exhaustion on the part of the male, and may it not consequently be indirect evidence that polygamy is not customary on his part? It must be within the power of most species to rear two broods at least in one season, and thus be able to replace the destruction of the first. Indeed, it is not

unusual to find a late second brood in the case of this species, and the fact of the first female building a third nest points in the same direction, and is evidence of expectation on her part. Failure, however, was the result, brought about, I believe, solely by abnormal conditions.

I have not yet noticed any striking variation in the duration of the period between the arrival of a female in a given territory and the laying of the first egg. So far as my observation goes this period is from seven to nine days, but since there is considerable variation in this respect in the case of other species, it is possible that it is really greater than the above figures represent it to be.

The female commences to build about two days after her arrival. Deducting these two days from the normal period of fertilisation, which is approximately eight, we get six days for the actual construction of the nest. This need not necessarily, and probably does not, represent the building capabilities of the bird; for with regard to rapidity of construction the female must be guided by the development of her ovaries. It will be remembered that the first female in No. 2 territory constructed her second nest in less than four days, and the second female her one nest in less than three. Under ordinary conditions a female builds rapidly for a short time and then ceases, and the greater part of the work seems to be done during the first few hours of daylight, for, before leaving a territory, I have taken particular notice of the details of a certain nest, and upon arrival the following morning have found nothing added thereto. The greater part of the actual construction is the work of the female, the male seldom, if ever, attempting to share this duty with her, but it is no uncommon occurrence for him to interrupt the process by flying at her and pursuing her through the bushes. Sexual desire is the cause of this, as it is the period of fertilisation. Although dead grass and dead leaves are made use of to a large extent in the construction of the nest, it is worthy of notice that in many instances the bark of the honeysuckle is utilised,

and in fact appears to be a favourite material. If the branches of the honeysuckle are examined, it will be noticed that the bark of itself peels off and splits up into long soft strands. The female consequently has little difficulty in tearing off the smaller shreds, with which she forms the foundation of the nest; and so much does it resemble decayed grasses that it is often a difficult matter to distinguish it. Honeysuckle abounds in many places resorted to by the Willow Warbler, and its bark is easily collected. It formed the foundation of all three nests constructed by the first female in No. 2 territory, and also of those in the adjoining territories. In fact it is constantly used both by this species and the Chiff-chaff. What particular merit can there be in its use? Why should it be preferred to dead grass? The use of it cannot be of "selection" value, for bark is not obtained more easily than decayed grass; the weaving of it into the foundation of the nest cannot make for stability, and an individual that persistently ignored the use of it would be in no worse a position, since other material in abundance is always close at hand. No doubt an earlier generation would have regarded the habit as an intelligent modification transmitted from parent to offspring, but such a view cannot now be entertained, and the behaviour of the birds does not admit of an appeal to tradition. It is just one of those details which so readily escape our attention on account of their triviality. We ask ourselves how comes it that this material should be used by different individuals and so frequently, call to our aid known laws and theories which in other directions successfully explain certain facts, apply them one by one, and finally lay them aside as unsound or insufficient, humiliated by the vastness of that which we deemed unimportant. The interior part of the nest is formed of the decayed stems of finer grass, intermingled with moss and dead leaves, the lining being usually feathers, but the third nest of the first female in No. 2 territory contained no feathers. All the nests that have come under my notice were situated on the ground, and, where possible, a sloping bank seems to be pre-

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ferred, although level ground is occasionally chosen, and in a flat country must often be resorted to. As a rule one egg is laid every twenty-four hours, but it sometimes happens that a day is missed, in which case the loss of time is made up by two being produced during the ensuing twenty-four hours. Six or seven eggs represent the normal clutch, but if the first nest is destroyed, the second clutch may consist of only three or four eggs. Incubation lasts from twelve to thirteen days.

It is possible to tell from the behaviour of the birds when the young are hatched, since there is a marked increase in the excitement they then show. This excitement may be said to be almost equal to that shown during the period of sexual activity. The period of incubation is a quiescent one; the male has nothing to do except to find food for himself, and for the female it is a time for rest. The energy to some extent exhausted during sexual activity is replenished, and upon the appearance of the young finds an outlet. A comparison of the manner in which this energy asserts itself at different periods forms one of the most interesting studies in bird life, a study to which in the future considerable time and attention must be devoted if we are to attain to a fuller knowledge of the meaning of the complex modes of behaviour, which are comprised under the term "expression of the emotions." I have just mentioned that, in the case of the Willow Warbler, the excitement shown at the period of parental care almost equals that at the period of sexual activity, and I do not think this is an exaggeration, for it would be a difficult task to draw a line between the two, or even to point to a single action which could be regarded as characteristic of only one period. It may be remembered that during sexual activity both sexes flap their wings in a peculiar manner. Upon the birth of the young I have seen the parents behave similarly; the female when near the male flapped her wings in the manner indicative of a desire for coition, and what is more curious still, coition appeared to be the result. But it is perfectly clear that this could not have

been the case, since the young were but a few hours old and required the care and assistance of a parent for some weeks. The approach of a member of another species is sometimes the signal for an outburst of excitement, and may result in a spirited attack upon the intruder. Of no bird is the approach so much resented as that of the Cuckoo, and so long as it remains in the neighbourhood of the nest the excitement, of the male especially, knows no bounds. If it happens to pass amongst the trees above the nest the male follows in pursuit, uttering a curious jumble of sounds intermingled with which are parts of his song, and upon his return moves uneasily from bush to bush, expressing his excitement by jerking, fluttering, spreading, and waving his wings, and at the same time fully expanding his tail. His attitude at such a time differs only in degree from that during sexual activity, the wings being more fully expanded and the tail fanned out instead of being slightly spread. It is curious that in the case of both the Willow Warbler and the Chiff-chaff there should be such resentment shown at the presence of a Cuckoo, and interesting also that the resultant expression of the emotion should be identical. If these two species were *especially* singled out by the Cuckoo as foster-parents for its young we could better understand their behaviour, but according to my experience this is not the case.

Of the two the female is the more timid. She it is who is suspicious when one approaches the nest, fluttering around for some time before she can gain sufficient courage to enter. The male is not so easily perturbed; he may hesitate before he carries food to his young and performs the necessary duties, but it is not for long. The female often finds courage in following in his wake, and therefore enters the nest immediately after, if not at the same time with him. She, however, shows all the while by her actions that her suspicions are not allayed, casting frequent hurried glances this way or that. The young remain in the nest about eleven days. For the first few days the female spends much of her time brooding,

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the male supplying a great deal of the necessary food. With the growth of the young these conditions alter, and about the sixth day the necessity for a constant supply of food being paramount both parents are consequently indefatigable in searching for and bringing *larvæ* to their hungry offspring. I cannot recollect having seen a male brooding the young, although he sometimes, for the purpose of cleaning the nest, remains for a few moments in it after having actually delivered up the food he was carrying. The *fæces* enclosed in a membranous sac are carried away by the parents and eaten or dropped some distance from the nest. For the first two days or so the young develop slowly, but afterwards the growth becomes more rapid. On the fourth day the primaries begin to show and the eyes are partly unsealed. On the sixth day the eyes are fully open, and by the seventh the young are active and make use of their call note, and the feathers on all the feather tracts show colour. The primaries are about a quarter of an inch long on the eighth day, down being still conspicuous on the head. By the eleventh or twelfth day the birds are sufficiently fledged to be able to leave the nest and fly moderately well, but for a while they remain on, or close to, the ground, being unable to rise to any height or to grasp the branches securely. Their strength, however, soon develops, and they follow their parents, who now roam beyond the boundaries of their territory, until able to find food for themselves. During July and August the males sing less and less, ultimately becoming silent, but after the moult is finished their plaintive song can again be heard occasionally until they leave the country in August or September.

In the life of the Chiff-chaff I remarked upon its peculiarly inquisitive behaviour, and since the Willow Warbler is so closely allied, it may well be asked whether it too possesses a similar trait. I can recall but little evidence pointing to its presence, for although a Willow Warbler sometimes shows excitement for no apparent reason at the presence of a member of another species, yet it is difficult to recognise that constant

intrusion upon, and apparent desire to be a spectator of, the quarrels and tragedies in the bird life of the surrounding district, so inseparable from the habits of the Chiff-chaff. At the same time it is not likely that it is altogether absent, but it is safe to say that it is by no means present in a similar degree, for whereas the inquisitive nature of the Chiff-chaff is constantly forcing itself upon our attention, that of the Willow Warbler has to be sought for, and can only be observed with difficulty, which of itself is evidence of considerable difference in the character of the two species.

The vocal powers are more highly developed than those of the Chiff-chaff. The song is unusually plaintive and sweet, appealing to some ears in a manner in which no other song is capable of doing. This is not difficult to understand, for in a wood inhabited by a number of different individuals the constant singing in reply to one another results in a concert which no one could fail to enjoy. When in full song early in the spring the bird utters its complete song from five to seven times a minute, and continues often for many minutes in succession without a pause, but when busily engaged in searching for food its song is heard more intermittently. Between the song of different individuals there seems to my ear to be a certain amount of variation, but I do not feel competent to judge wherein exactly it lies, although the difference often appears to be connected with the pitch; and I am not at all sure that the same individual does not at times vary its song, in addition to its frequent habit of commencing in the middle and leaving out the higher notes. The song really consists of so few notes and the difference between the notes is so slight, that any attempt to resolve it into its constituent parts is very difficult. In different localities there is considerable variation, which is in a great measure due to alteration in the pitch. On the west coast of Ireland, for instance, the tone is deeper, whereas in Hungary it is higher, and, to my ear at least, not so pleasing. In addition to the song there are sundry call notes, and the most common one to which I have

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not yet alluded is uttered at times of anxiety, or seemingly for no ostensible reason. It is very similar to the corresponding note of the Chiff-chaff, and very difficult to distinguish therefrom, consisting of two notes uttered in a plaintive key, but more slowly or rather not so briskly as those of the other bird.

Their food is similar to that of the Chiff-chaff, and consists almost entirely of insects. Occasionally they peck at the fruit in gardens, and can often be found in the autumn in the elder bushes, but I do not recollect having seen them actually feeding on the berries. Their principal food when they arrive consists of the various species of *Chironomidæ*; these they seek for diligently, examining large and small branches, buds, and leaves. Since they are later than the Chiff-chaff in arriving at their breeding grounds, they probably do not suffer so much from scarcity of food brought about by abnormal climatic conditions. Nevertheless they are compelled sometimes to face frost and even snow, and they then lapse into silence, less able apparently to withstand the cold, or more probably less capable of replacing their usual diet by more minute and hardy insects. Later in the season *larvæ* form their staple diet, especially those of the oak-leaf roller moth (*Tortrix viridana*). The young are principally fed on *larvæ*.



RUFOUS WARBLER.

Aëdon galactodes, *Gould, Birds of Great Britain*, vol. ii, 2 pp., pl. 53 (coloured figures of adults), 1870; *Yarrell, British Birds*, 4th Ed., vol. i, edited by Newton, pp. 355-359 (woodcut), 1873; *Dresser, Birds of Europe*, vol. ii, pp. 547-552, pl. 85 (coloured figure of adult), 1874; *Lilford, Coloured Figures*, vol. iii, p. 30, pl. 15 (coloured figure of adult), 1883; *Saunders, Manual of British Birds*, 2nd Ed., pp. 73-74 (woodcut), 1897.

Sylvia galactodes, *Seeböhm, British Birds*, vol. i, pp. 418-422, pl. 10, fig. 8 (egg), 1883.

Arabic, *Bou-Djeha*; French, *Bec-fin rubigineux*; German, *der rostfarbige Sanger*; Italian, *Rusignolo levantino*; Spanish, *Alzacola, Rubita, Vinadera*.

DESCRIPTION OF THE PLUMAGE.

Adult Male.—The upper parts generally are rusty isabelline, rather darker on the crown, rump, upper tail-coverts and two central tail-feathers. The rest of the tail-feathers are rusty brown, the three outer ones being broadly tipped with white followed by a band of blackish brown, while the two next ones are tipped with blackish brown only. The least wing-coverts, medium, and larger secondary coverts are the same colour as the upper parts. The flight-feathers are brown, the secondaries being edged with the same colour as the back and tipped with whitish brown, and approximately two-thirds of the outside edges of the primaries is rusty isabelline. The primary coverts and bastard-wing are brown edged with sandy buff. There is a distinct creamy white superciliary stripe, the lores are smoky brown and under the eye is a creamy white space, the cheeks being light rusty isabelline. The underparts are buffish white and the flanks buff. The abdomen proper is whitish, the

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under tail-coverts whitish buff, the underparts of the tail rusty mauve and the shafts of the feathers whitish buff. Axillaries and under wing-coverts are whitish isabelline and the underside of the wing the same colour as the underside of the tail, only paler. The bill is horn brown, the posterior part of the lower mandible being dark flesh colour. The iris is dark brown and the feet greyish buff.

The autumn plumage is similar but rather paler.

The young resemble the adults but the upper parts are rather more reddish, the eye stripe yellowish, and the lores a little lighter brown.

GEOGRAPHICAL DISTRIBUTION.

There are only three records of the occurrence of this warbler in **England**, two from Devon and one from Sussex; the only other record for the **British Islands** being a specimen which was obtained at the Old Head of Kinsale, Co. Cork.

This bird is a southern species not found in **France** and apparently not visiting the northern parts of the Peninsula. However in the south of **Spain** and **Portugal** it is common, especially in Andalucia, Murcia, Valencia, Castellon and the Balearic Islands. Occasionally it reaches **Italy**, Malta is passed on migration, and it is found breeding in parts of **Palestine**. Throughout **Morocco**, **Algeria**, **Tripoli** and **Egypt** it is generally distributed and it is found in the **Egyptian Soudan** and on the White Nile both in winter and spring, visiting in addition **Abyssinia** and **Somali Land** in winter.



THE BIRD

SAVI'S WARBLER.

Salicaria luscinioides, *Hewitson, Eggs of British Birds*, 2nd Ed., vol. i, pp. 89*-90*, pl. 25* (egg), 1846; *id.*, *id.*, 3rd Ed., vol. i, pp. 115-116, pl. 31, fig. 2 (egg), 1856.

Lusciniopsis luscinioides, *Gould, Birds of Great Britain*, vol. ii, 2 pp., pl. 77 (coloured figures of adults and nest), 1866.

Acrocephalus luscinioides, *Yarrell, British Birds*, 4th Ed., vol. i, edited by Newton, pp. 389-397 (woodcuts of adult and nest), 1873; *Lilford, Coloured Figures*, vol. iii, p. 46, pl. 23 (coloured figure of adult), 1886.

Locustella luscinioides, *Dresser, Birds of Europe*, vol. ii, pp. 627-632, pl. 93 (coloured figure of adult and nestling), 1875; *Seebohm, British Birds*, vol. i, pp. 346-349, pl. 10, fig. 20, 1883; *Saunders, Manual of British Birds*, 2nd Ed., pp. 91-92 (woodcut), 1898.

Dutch, *Nachtigaal-Rietzanger*; French, *Fauvette des Saules*; German, *Weidenrohrsänger*; Hungarian, *Déli nádifülemile*; Italian, *Salciajola Pagliarol*.

DESCRIPTION OF THE PLUMAGE.

Adult Male in Spring.—All the upper parts are uniform olive brown. There is a distinct superciliary stripe, the lores are smoky grey, and the sides of the head are the same colour as the upper parts, but rather lighter. The shafts of the ear-coverts are cream colour. The flight and tail feathers are brownish, the latter being marked by faint transverse bars. The throat and abdomen are white, the rest of the under-parts together with the long under tail-coverts being pale rusty brown, the latter having greyish white tips. The underside of the tail is greyish brown, the axillaries pale chocolate colour, and the underside of the flight-feathers light greyish brown. The upper mandible is dark horn brown,

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lower rather more whitish, the iris light brown, and the feet light brownish flesh.

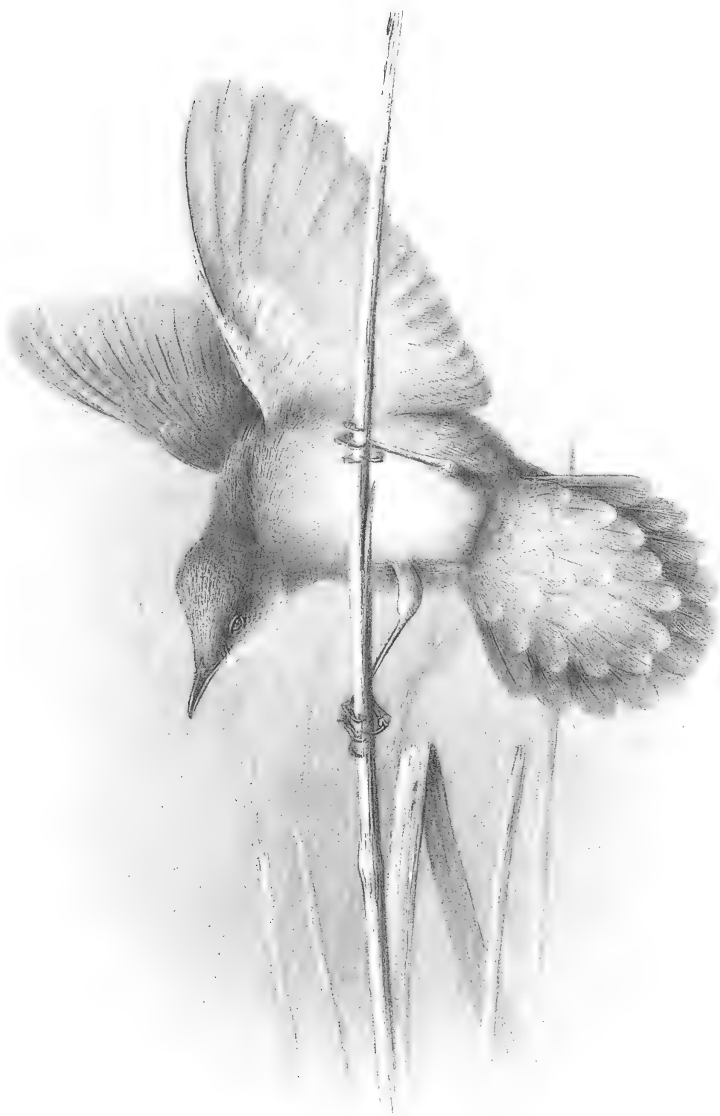
The colouring of the female does not, as a rule, appear to be so intense.

The young bird after the first moult is richer on the upper parts, and the white on the under parts is less intense.

GEOGRAPHICAL DISTRIBUTION.

In former times this bird nested regularly in Norfolk, Cambridgeshire and Huntingdon, but since the draining of the Fens these districts have been deserted, and it is now many years since it was last recorded as a breeding species in **Great Britain**. There is, however, one recent record in this country, a specimen having been obtained on Fair Isle in the spring of 1908.

Formerly it must have been very plentiful in **Holland**, but, as in our Fen districts, recent drainage has affected its numbers and banished it from many localities. Yet it has by no means deserted the country, being still almost common in places. In **Belgium** it is very rare, but is said to be found near Antwerp. Heligoland possesses no record of it on passage, and from **Denmark** and **North Germany** it is absent. In **Spain** it is common in places, especially in parts of Andalusia. There are records of its occurrence in **Portugal**, and the south and south-western parts of **France** are visited, especially the Camargue and the country round Bordeaux. To **Italy** the bird is a local summer visitor, being found more especially in the Venetian bogs, the Po Valley and in Tuscany. From Sardinia there is only one record, but it occurs locally in Sicily and Malta. It is not found in **Switzerland**, but eastward becomes plentiful, more particularly in Austrian Galicia and in many parts of **Hungary**. Probably it occurs in all suitable localities on the lower Danube, but from **Montenegro** and **Greece** there are no records. In the southern and



MALE SAVI'S WARBLER

ATTITUDE ASSUMED DURING THE
PERIOD OF SEXUAL ACTIVITY

PUBLISHED BY F.H. PORTER

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SAVI'S WARBLER

central parts of **Russia** eastwards to the Volga delta it is generally distributed, **Poland** being the northern breeding limit, where it is locally not uncommon in the provinces of Plock, Lublin and Warsaw. In **Southern Russia** the most favoured provinces are Volhynia, Podolia, Khiev and Kharkov, and specimens have been obtained on the River Don and in the Crimea. In the Volga district the bird is common, and there is a record of its occurrence in the province of Orenburg. In **Turkestan** it occurs in Sir Daria. In **Palestine** we find it a scarce summer visitor, but in **Egypt** a common breeding species, and we meet with it again in **Tunis**, **Algeria** and **Morocco**. The winter appears to be passed in the northern parts of **Africa**.

LIFE-HISTORY.

The few days I spent in studying this beautiful bird on the Valencze Lake in Hungary were sufficient to show that its habits are of unusual interest, and as a naturalist I cannot but regret the altered conditions, the necessary progress of civilisation, which have banished this bird from its old home in the Eastern Counties. It inhabits the dense masses of the common reed (*Arundo phragmites*), where the roots are sufficiently thick to afford protection for its nest, and such situations must have been plentiful before the fens were drained.

With regard to the date of arrival in different European countries I have no information, but on April 25th, 1904 many males had already arrived on the Valencze Lake, and as the females commenced to arrive on the following day, it is probable that the former had been there some little time. The question of breeding territory seems to be of importance to the males, but since I have had so few opportunities of studying the birds, and none of studying a male immediately upon arrival at its destination, I am unable to produce evidence of any struggle for possession; nevertheless from the

behaviour of the male after the female has arrived I infer that this question is of importance, since he confines himself more or less to certain boundaries, and moreover possesses a headquarters, usually a prominent dead reed, to which he returns after following the female, and from which he pours forth his song.

Before the arrival of the females the song of the males can be heard in every direction throughout the day, though the "trills" are longer and the song more persistent in the morning and the evening. Climbing up some dead reed and sitting near the top the male utters his peculiar note, turning his head first in this direction and then in that, and thereby producing a similar ventriloquistic effect to the song of the closely allied Grasshopper Warbler. Perched thus on the top of some tall reed he is a conspicuous figure early in the season before the new reeds have attained to any considerable height, and where the species is plentiful there is consequently little difficulty in locating the males and watching their movements.

Upon the arrival of the females, excitement is considerable, and a great deal of restless movement then takes place. One can trace the quarrelling and pursuing, and observe without difficulty the general excitement reflexes inseparable from the behaviour of most species when the sexual instinct is dominant. What the direct stimulus to all this varied behaviour is I am unable to say without further detailed observation, a short description therefore of the behaviour of both sexes as it actually appeared to me must suffice under the circumstances.

The actions of both sexes during this period are very beautiful, and in many respects interesting, but especially so for the reason that they are identical with those of the Grasshopper Warbler at a corresponding period. The two species are closely related, and we might reasonably expect to find a similarity of behaviour, but it is a curious fact that identity of structure does not necessarily imply identity of emotional expression. The Chiff-chaff and Willow-Warbler, the Reed



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SAVI'S WARBLER

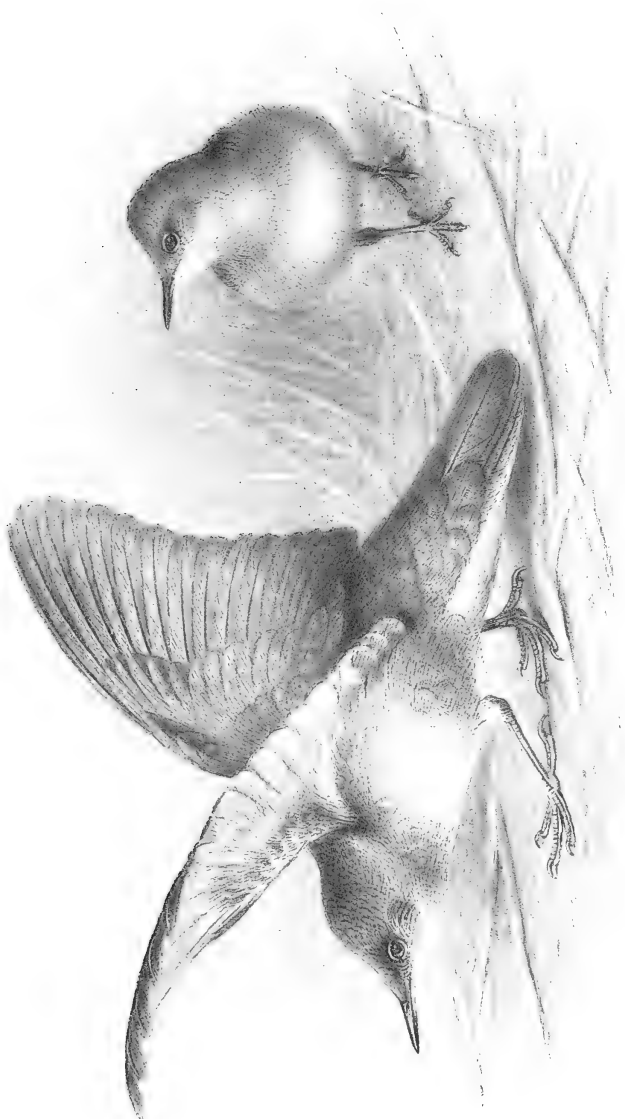
and Marsh Warbler, and the two Whitethroats are severally very closely allied, but by no means adopt a similar method of expressing their emotion. Therefore the identity of expression of the Grasshopper and Savi's Warbler is the more interesting. Both sexes are very excitable at this period, the male sings persistently, and while doing so seems to be watching the movements of the female. She runs about, mouse-like, amongst the thick masses of dead reed, and the male espying her climbs or flutters down the reed upon the top of which he was singing and pursues her, running in and out amongst the reeds, at one moment spreading his wings and flapping them up and down and then expanding his tail like a fan, and at another following her in a stately way carrying his head erect, or yet again creeping after her with his head lowered, threading his way in and out of the stems. The tail when expanded may be either raised or lowered, and a dead leaf of the reed is often searched for, picked up, and carried in the wake of the female. In this way the male pursues her around his territory, eventually returning to the reed which forms his headquarters, up which he climbs, and then again commences his peculiar song. When on the ground both sexes are able to run with considerable speed, but sometimes they move by hopping. Like the Grasshopper Warbler they have the peculiar habit of walking along a horizontal reed, and the male does so even when with wings and tail outspread he is pursuing his mate. The behaviour of the female during this period is unusually interesting, for she not only sings but also pursues the male, and even opens and closes her wings when close beside him.

The nest, which is rather deep and solidly constructed, is placed at the base of the reed stems and is composed of the interwoven leaves of the common reed.

The song is similar in type to that of the Grasshopper Warbler, but far more musical, and in a way resembles the tinkling of numerous tiny bells. The bird produces the notes with its bill widely opened. At the commencement there is a

BRITISH WARBLERS

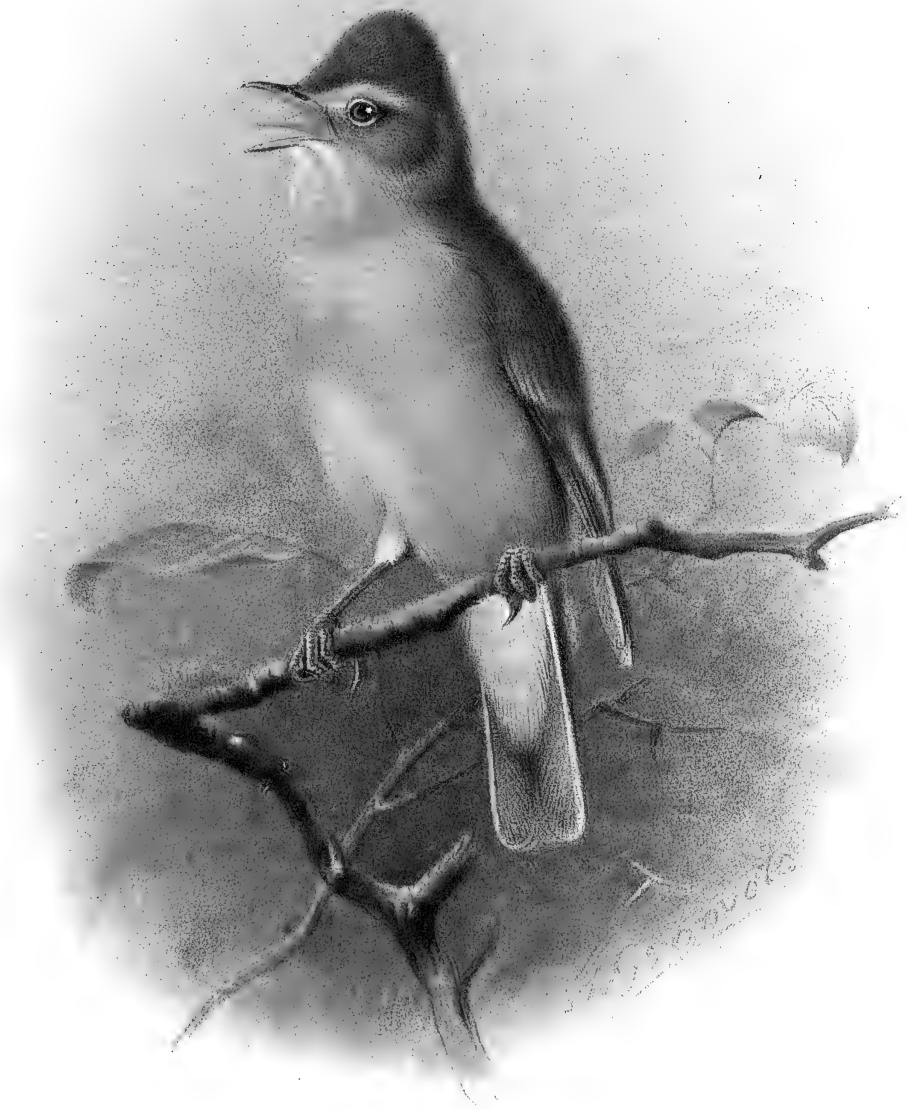
peculiar rattling sound, the clear notes then follow and continue for some minutes in succession. In addition to the song there are numerous call notes, difficult to express in words, but the one most frequently used resembles the call note of the Hawfinch, so that when a number of males are close together the sound produced reminds one of a small flock of that species in flight. To my ear the call note of the female appears to be somewhat different from that of the male.



SWAN. *ANAS SWAN*.
ATTITUDE ASSUMED DURING THE PERIOD OF SEXUAL
ACTIVITY IN THE PRESENCE OF THE MALE.

ILLUSTRATED BY N. H. POSTER

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